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THE SOUTH PACIFIC TOUR

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Between November 15 and December 15 my wife and I conducted a group of 32 persons (many of them present or former students of the Arboretum School) on a tour of the South Pacific. Major emphasis was on New Zealand and Australia with a stop-over in Tahiti on the way out and visits to the Fiji Islands and Hawaii on the return trip.

In an effort to set up this tour we had covered much the same ground in January 1972, and an account of that trip appeared under the title "A Visit to the South Pacific" in this *Newsletter* for March 1972 (Number 8). However, the two itineraries were by no means identical and the wealth of plant material seen was so varied that there need be very little duplication between that account and the present one.

Most of our party flew from Philadelphia to Los Angeles, where we were met by members coming from other points of the compass. The following day, Friday, November 16, we went by chartered coach to visit the Huntington Botanical Gardens at San Marino, where we were graciously received by Dr. Myron Kimnach, Curator and Superintendent. These gardens, consisting of more than 200 acres, are renowned not only for their superb plant collections, but also for their library and art gallery.

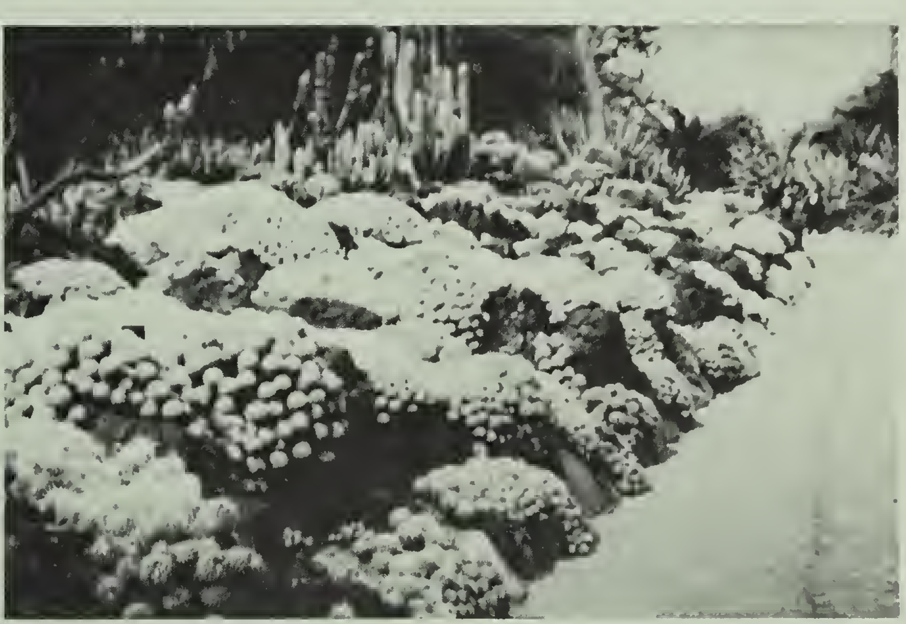


Fig. 2. *Mammillaria* in the Huntington Gardens

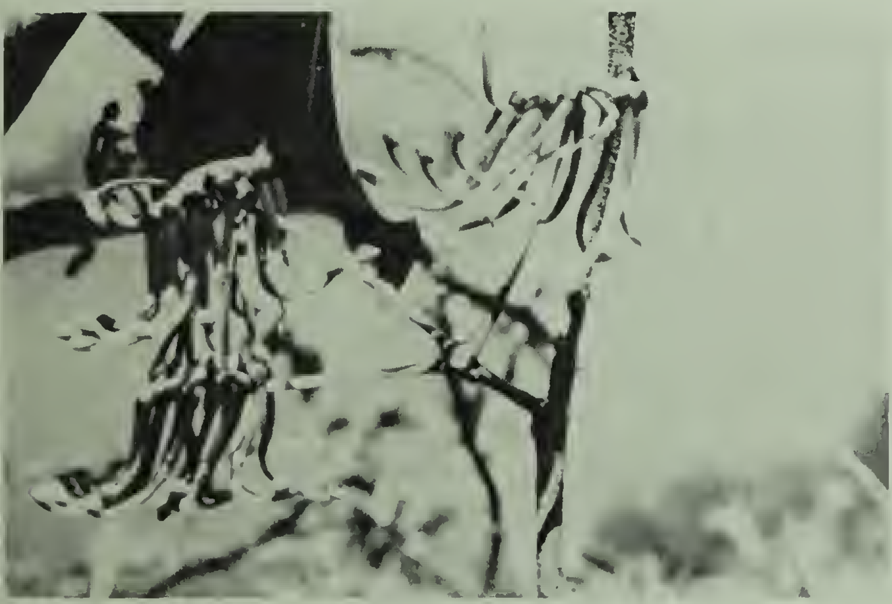


Fig. 1. *Stenocarpus sinuatus*

To do justice to this rich assemblage of more than 9000 kinds of plants in a few brief paragraphs is altogether impossible. The palm section alone would require many pages and the conifers a similar coverage. Among the latter we were pleased to see a thriving specimen of *Taxodium mucronatum*. This is the same species as the "Big Tree" of Santa Maria del Tule, south of Oaxaca in Mexico.

The Magnolia family is well represented and in it we observed *M. Delavayi*, an evergreen species native to China, and *Michelia Doltsopa*, from southern Asia, neither of which is hardy in the Philadelphia area.

Many Australian plants grow well in this region and Dr. Kimnach proudly showed us a specimen of the wheel-of-

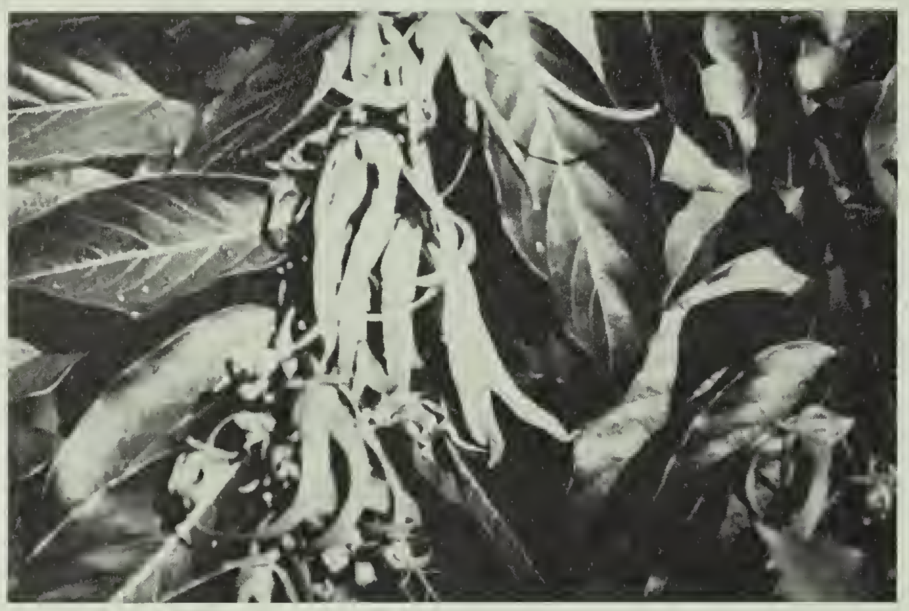


Fig. 3 *Cananga odorata*

fire tree. This is *Stenocarpus sinuatus* of the Proteaceae, a family which is so abundantly represented in Australia and South Africa. Since I believed we would be too early to see it in flower on our tour, I took advantage of the opportunity of photographing it here (Fig. 1).

The Japanese Garden, one of the finest on the west coast, has been greatly enlarged since my wife and I first saw it in 1965.

Undoubtedly, the brightest jewel in the Huntington crown is its desert garden, which must be considered one of the finest in existence. Here, in an area of some ten acres, a series of winding walks lead one through a collection of many thousands of cacti and succulents from the arid regions of our own southwest, Mexico and South America as well as from many regions of the Old World.

Among the most spectacular displays are the numerous kinds of *Mammillaria* (Fig. 2), the handsome golden balls *(Echinocactus Grusonii)*, many species of *Opuntia* and, of course, the famed saguaro *(Carnegiea gigantea)* from Arizona. Of other succulents there are yuccas and agaves from our own deserts, ficoids, aloes and euphorbias from Africa, and representatives of such genera as *Crassula, Sedum, Echeveria, Aeonium* and *Sempervivum* from lands both near and far.

Later that night we boarded a plane for Tahiti arriving in Papeete, the capital, early the following morning.

The grounds adjoining our hotel (the Tahara'a Intercontinental,) support a rich and varied collection of tropical plants and a mid-morning stroll served as an introduction to this wealth of material. Many of these were described in the earlier *Newsletter*, but there were plenty of novelties worthy of mention here, among them the following:

Pseuderanthemum reticulatum. A shrubby member of the Acanthaceae with light pink flowers and attractively veined leaves.

Cananga odorata. A tree belonging to the Annonaceae which was in both flower and fruit. The former is the source of the perfume known as ilang-ilang (Fig. 3).

Brunfelsia calycina. This interesting shrubby representative of the Solanaceae bears flowers which may be violet, purple, blue or even white. Among its several common names perhaps the most picturesque is "morning, noon and night".

Two species of *Acalypha* of the Euphorbiaceae: *A. Wilkesiana*, the copper-leaf and *A. hispida*, the chenille plant.

The following day, Sunday, November 18, saw our party bifurcated, one half flying to Bora Bora, one of the easternmost of the Society group, the other in tiny Cessnas to the much nearer Moorea. Since my wife and I had already visited Bora Bora, we elected to join the latter group.

Moorea is one of the islands visited by Captain Cook following his departure from Tahiti and one of its most salient features is the bay which bears his name. This body of water is rimmed with verdant slopes from which arise a series of jagged volcanic peaks (Fig. 4).

During the course of a brief tour of the island we observed a handsome red-flowered *Metrosideros (M. collina)*, a low double-flowered *Clerodendron (C. fragrans* var. *pleniflorum)*, *Panax Guilfoylei* and *Ervatamia divaricata*, the last a white-flowered shrub resembling a jasmine, but actually a member of the Apocynaceae.

Back at the Bali Hai Hotel at noon, we witnessed the exhumation of our lunch from a sand-covered pit. This consisted of roast pig, taro, cassava, breadfruit and a number of other South Pacific gastronomic specialties which we were unable to identify.

The grounds of the hotel were occupied by a large number of thatched guest cottages under a canopy of coconut palms and surrounded by bougainvilleas, allamandas and a host of other tropical plants. Conspicuous among them was a beautiful endemic *Gardenia (G. tahitiensis)* which we had first seen in Bora Bora. Later that afternoon we flew back to Tahiti.

The following day (November 19) we left the hotel for a tour of the island. We went first to Venus Point on Matavai Bay where Captain Cook had observed the transit of Venus on June 3, 1769. We then followed along the north shore, pausing from time to time to admire the scenery or to identify and photograph plants. At one point we stopped the coach and ascended a steep, rocky trail to admire a waterfall of glittering beauty descending from an escarp-

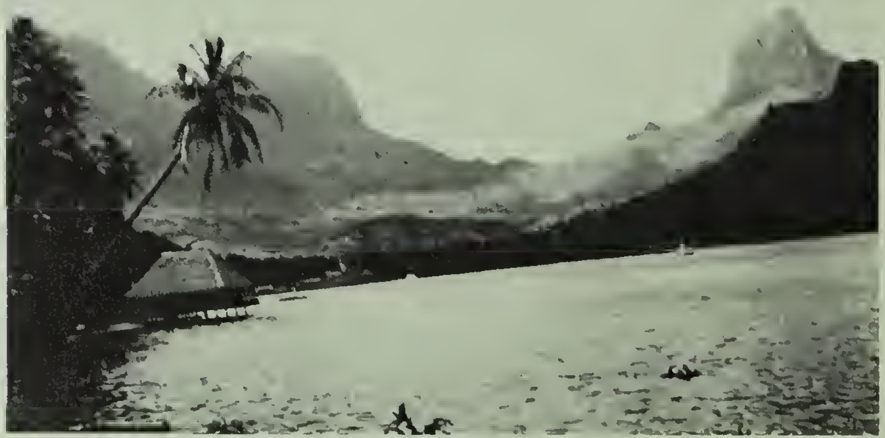


Fig. 4. Captain Cook's Bay on Moorea

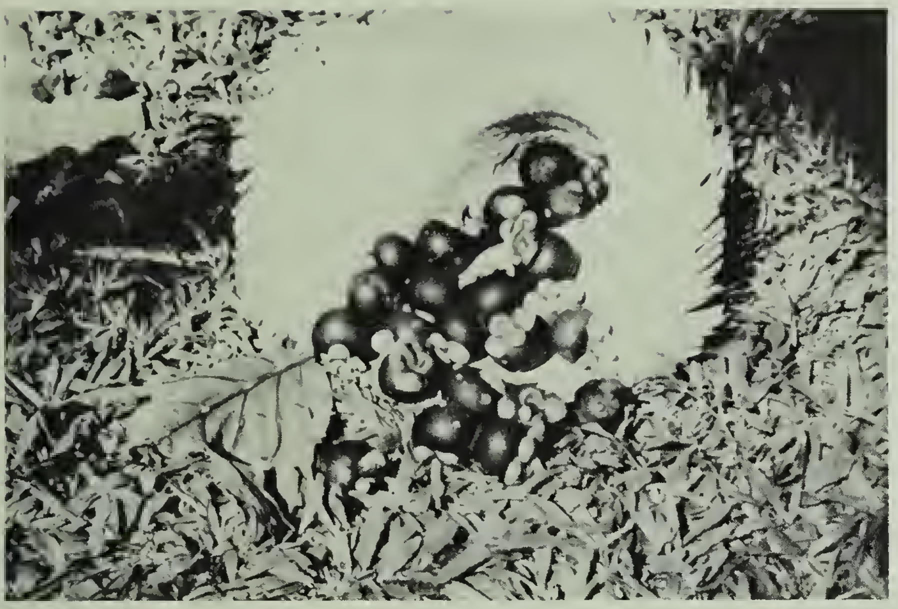


Fig. 5. *Garcinia mangostana*

ment high above. It was in this ravine that we first saw *Angiopteris*, a rather primitive fern whose ancestry extends many millions of years back into Paleozoic time. Here, to our surprise, numerous plants of coffee *(Coffea arabica)* had become established and I collected a full herbarium sheet of seedlings only three or four inches high. Here, too, were robust trees of *Barringtonia*, that exciting member of the Lecythidaceae or Brazil-nut family with its large four-sided fruits. Another plant was *Morinda citrifolia*, a fascinating member of the Rubiaceae (which we had already seen on the grounds near the hotel) with aggregate fruits.

Following lunch at a waterfront restaurant near the Gaugin Museum, we visited the Botanical Garden of Papéari. This garden had been developed to a high level of excellence by Harrison W. Smith, an American philanthropist who died in 1947. When we were here before we found it in a sad state of neglect. Today, under the curatorship of M. Michel Guérin, the garden has undergone a transformation. The grounds have been cleaned up, the specimens have been rejuvenated and labeled and new plants have been added. It was our great fortune to have M. Guérin with us the entire day and especially to have him conduct us around his garden.

One of the first things we saw was an enormous clump of *Dendrocalamus giganteus*, a bamboo fifty feet tall with many hundreds of culms. Nearby was our first mangosteen.

Now, to those who have followed David Fairchild's worldwide quest for favorable strains of the four hundred species of the genus *Garcinia*, it was something of a thrill to see one "in the flesh". The species growing here was *G. mangostana* and Michel kindly collected fruit for us, opened them and passed them around. The glistening flesh was quite delicate to the taste, something like that of a cool lime sherbet (Fig. 5).

We were keenly interested in a species of *Thunbergia* quite unlike other members of the genus with which we were familiar. This was *T. mysorensis*, a vine with hanging racemes of brilliant red and yellow flowers. Among other noteworthy plants were *Brownea ariza* (a legume from South America with great powder-puffs of red flowers) and *Myristica fragrans*, a nutmeg of commerce. *Warszewiczia coccinea*, a striking member of the Rubiaceae with a single bright red bract-like sepal, was here at the very peak of its performance.

One of the most impressive features of this garden is a five-acre area occupied almost solidly by plants of the Tahitian chestnut, *Inocarpus edulis*. This is a leguminous tree with widely buttressed trunks and edible fruits. Upon leaving the garden we visited the Gaugin Museum, then drove back along the east and south shores of the island to Papeete.

On Tuesday, November 20, we reluctantly departed from Tahiti on a flight which landed us in Auckland, New Zealand, in late forenoon.

That afternoon our good friend, Mr. Philip J. Jew, Manager of the Auckland Regional Authority, took us to see a fine stand of the famous kauri pine, *Agathis australis*. This noble tree, a member of the Araucaria family, has broad leaves quite unlike most gymnosperms. It was formerly rather widespread in the North Island, but because of the value of its wood has been largely destroyed and is now restricted to a few areas north of Auckland. When Mr. Jew had taken my wife and me to see a stand in 1972 it involved something of a scramble. Since then, however, a new reserve has been set aside at Waitakere. Our bus came to rest in a comfortable parking spot and we then walked for a short distance down a woodland trail which possessed the advantage of introducing members of our party to some of the characteristic plants of New Zealand.

First and foremost was *Leptospermum*, or "tea" tree, a member of the Myrtaceae, which is so abundantly represented in this part of the world. There were two species here, both just coming into flower.

Then there was *Phormium* or New Zealand flax, a member of the Agavaceae, and all around us the so-called New Zealand pine, not our pine, of course, but a species of *Dacrydium*, locally known as red pine or rimu. *Astelia*, a liliaceous epiphyte, took the place of our American bromeliads which it superficially resembles.

There were about a dozen huge kauris here and their gigantic girth and awe-inspiring height made this a memorable visit.

Fig. 6. View in the Eden Garden

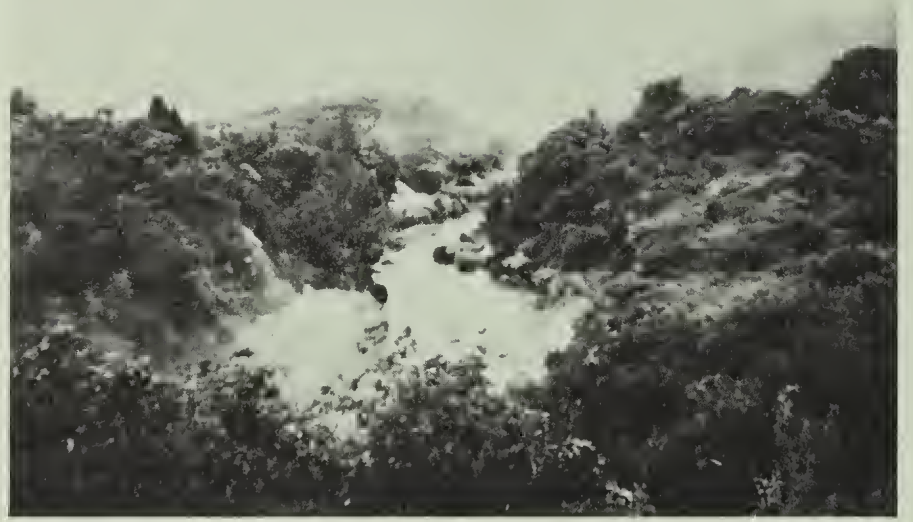


Fig. 7. Thermal springs at Rotorua

It may be worthy of mention that I had placed in the hands of each member of the tour mimeographed lists of some of the more characteristic genera of both New Zealand and Australia plants. It seemed to afford them some satisfaction to identify and check off each genus as we encountered it. Frequently I would hop out of the bus, collect half a dozen specimens, name and tag them, then pass them around for the members of the party to enter in their notes. In this manner we acquired some familiarity with the more salient features of the vegetation of these two major areas.

The next day we went first to visit Albert Park with its well-executed floral clock and beautifully tended lawns. Phil Jew had arranged for us to be met and shown around by Messrs. Aubrey Smith and S. P. Fox of the Auckland City Council and we were indeed grateful for their guidance. One of the first plants they showed us was the kowhai *(Sophora tetraptera)*, a leguminous tree which is sometimes considered the national flower of New Zealand. It was past bloom but we saw the four-angled fruits which give it its specific name.

One of the proudest possessions of this park is the hand-flower tree of Mexico *(Cheiranthodendron pentadactylon)* which was here at the very height of its bloom. There were also some very fine specimens of *Ficus* and many of the native conifers which we had seen the day before.

A visit to the Auckland Domain was next in order and here we enjoyed the spacious grounds, the aquatic garden and the well-stocked greenhouses as well as a good collection of cacti and other succulent plants.

The crowning experience of the morning was an hour or so spent in the incomparable Eden Garden. Our previous visit here had been a frustrating affair of only a brief quarter of an hour. Now we not only had more time but, thanks again to Philip Jew, were received by Mr. Jack Clark. It was in 1964 that Mr. Clark persuaded fifteen other people to help him in taking over an abandoned quarry and converting it into one of the finest small gardens imaginable (Fig. 6). Today, against a background of tree-ferns and conifers one may enjoy the almost limitless number of woody and herbaceous plants which can be grown in the very favorable climate of Auckland. From the lower level of what was the quarry one ascends by a series of well-modulated paths to the McLiskey Lookout which affords a splendid view of the garden far below as well as the surrounding countryside. It is of real interest to note that, as far as we observed, every plant in the garden was provided with a label giving its botanical name; would that this could be said of every garden in the world! Many of the labels bear the name of a donor or commemorate someone who has been a benefactor of the garden. Any attempt to single out even a few of the more interesting plants grown here would be both discriminatory and futile.

Before returning to the hotel for lunch our driver took us to the top of Mt. Eden, one of two extinct volcanic craters which dominate the skyline of Auckland. From its summit we had a breath-taking view of the city and its environs.

On the occasion of our earlier visit we had flown from Auckland to Rotorua, a region famous for its thermal springs and Maori settlements. This time we elected to go by coach, which enabled us to see something of the countryside as well as to visit the unique glow-worm caves at Waitomo.

The first few miles led along the valley of the Waikato River and through undulating terrain devoted largely to sheep and cattle, with some farmland. Below Hamilton, however, the character of the country changed and we began to note standards of New Zealand "beech" *(Nothofagus Menziesii)* and hedge-rows of "tea" tree *(Leptospermum scoparium)*, the latter in full flower.

The Waitomo glow-worm caves have long been of interest to scientists and are well worth a visit. One is led downward through a series of limestone grottoes to a platform at which point the guide extinguishes his torch. As one's eyes become adjusted to the darkness the entire ceiling of the cave is seen to glow with myriads of tiny bluish lights. Flash photography is not permitted, but as a guide momentarily played his torch upward it disclosed that from each organism there depends a fine thread some three or four feet in length resembling, as one visitor has said, "miniature necklaces of shining tiny diamonds." It is to these tenuous strands that small insects flying through

Fig. 8. Blue Lake

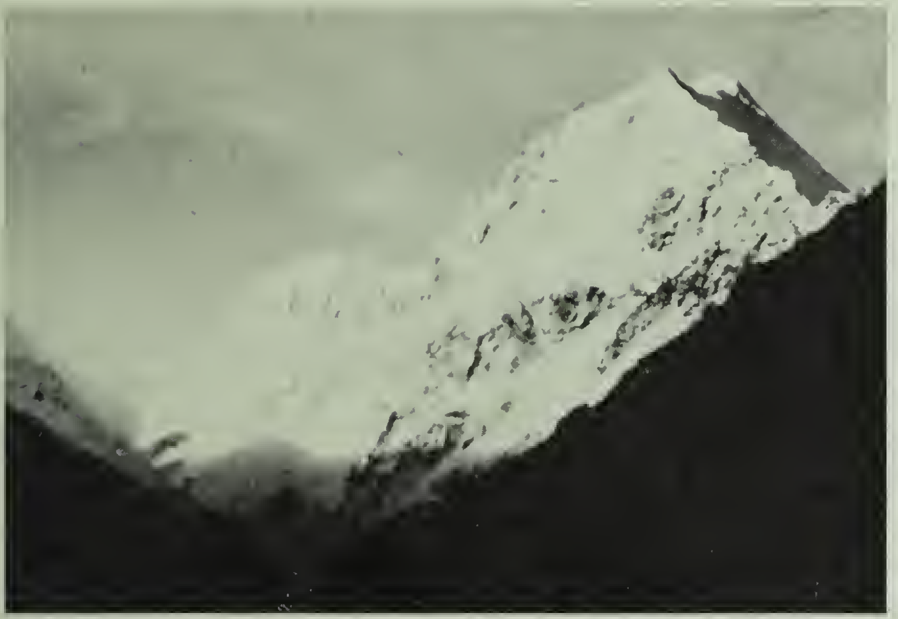


Fig. 9. Mt. Cook

the cavern are attracted and are caught, thus providing a source of food for the glow-worms.

It should be noted that the term glow-worm, in this and many other connotations, is a misnomer. The common glow-worm of the Old World is not truly a worm, but a beetle. The luminescent larvae of certain fire-flies may also be called glow-worms. In the case of the Waitomo caves the organism is the larva of a kind of fly *(Boletophila luminosa)*, which has become completely adapted to this almost unimaginable mode of existence.

We then descended two steep flights of steps to a wharf where we embarked in a number of small boats and were propelled around an underground lake the ceiling of which was so delicately and brilliantly illuminated that it seemed as though the Milky Way had been brought almost within arm's reach.

That afternoon, as we drove eastward toward Rotorua, we found ourselves traversing the dense evergreen forest known in New Zealand as "the bush". The conspicuous trees were the rimu or red pine *(Dacrydium cupressinum)* and totara *(Podocarpus totara)* with occasional colonies of tree fern *(Cyathea)*. Although New Zealand boasts very few Proteads (compared to the enormous number to be found in Australia) there is one notable exception, namely the genus *Knightia*. Here, for many miles, we were delighted to observe the dark red flowers of the New Zealand "honeysuckle" *(K. excelsa)* against the dull green leaves.

Rotorua, a sprawling town situated among a bevy of some thirty lakes, is famous for its thermal springs and Maori village. The morning after our arrival we went first to visit a center of Maori carving and weaving, then walked through an extensive area of hot springs, fumaroles, mud-boils and geysers, the whole permeated by fumes of sulfur (Fig. 7). It is here that a Maori village is situated with cottages, community centers and a church. It is fascinating to see a man dash out of his house, carrying a chicken in a reticule, dunk it in a steaming cauldron, and leave it there until it is ready for the family dinner. The energy crisis here is negligible!

We next paid a visit to Rainbow Springs which is an unusual combination of a woods with a fabulous collection of native ferns, a series of pools containing thousands of trout (ranging in size from minnows to patriarchs) and an exhibit of New Zealand birds plus an enclosure occupied by deer.

After lunch we drove southward to see two of Rotorua's beautiful lakes, the Blue and the Green which although only a few yards apart, are separated by an elevation of 64 feet (Fig. 8). In the distance loomed Mt. Tarawera, a volcano the eruption of which in 1886 had completely destroyed a Maori village.

Early on the afternoon on Sunday, November 25, we flew from Rotorua to Mt. Cook where we had reservations at the beautifully situated Hermitage Hotel.

When we were here in 1972 Mt. Cook had been very largely under a cloud cover. This time it was different; the snow-clad peak was brilliantly visible all that afternoon and the following morning (Fig. 9).

Although Mt. Cook is the tallest (12,349 feet) it is but one of hundreds of lofty peaks which make up the 450 mile chain of Southern Alps that extends from one end of South Island to the other.

Despite the fact that these mountains consist largely of very ancient igneous and sedimentary rocks, their uplift is of recent origin, dating back only a few million years to late Cenozoic time.

The grounds around The Hermitage are attractively planted with a wide variety of native species, giving us a happy preview of much that we were to see later in the field. A few of these deserve special mention:

Ranunculus Lyallii, known as the "Mt. Cook lily", the world's largest buttercup, with enormous leaves and pure white flowers (Fig. 10).

Celmisia spectabilis. A handsome composite commonly found on the borders of ice-fields.

Gaultheria depressa. Although the Ericaceae is rather poorly represented in the southern hemisphere, the genus *Gaultheria* is an exception and this is one of a half dozen species found in New Zealand.

Hebe salicifolia. There are said to be over 90 species of this characteristically alpine genus in the archipelago;

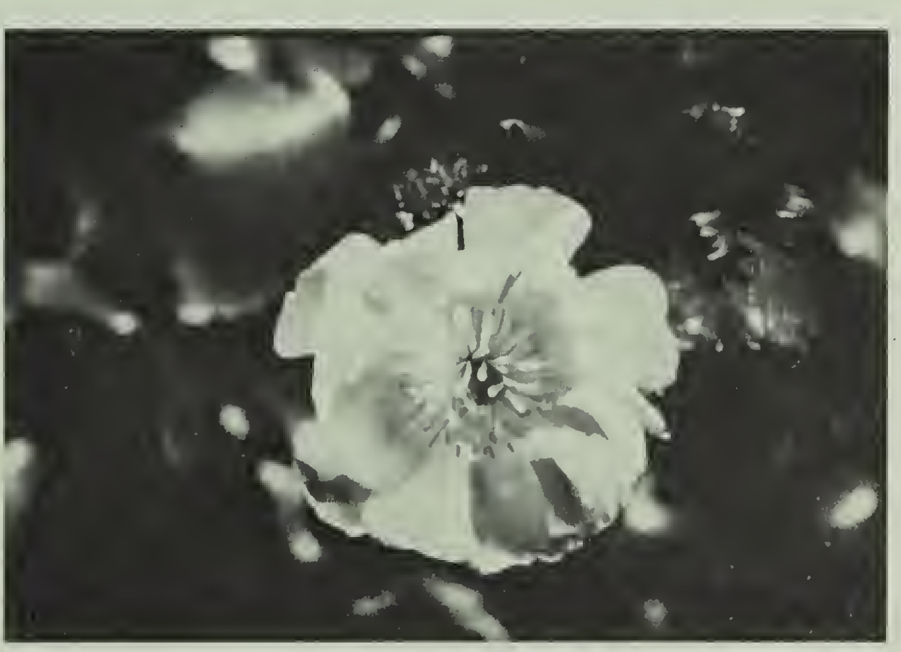


Fig. 10. *Ranunculus Lyallii*

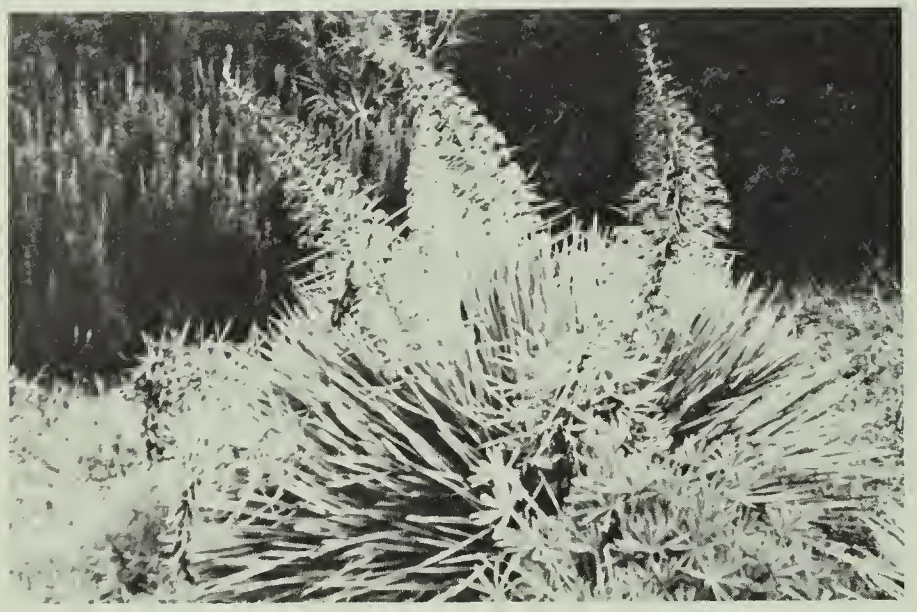


Fig. 11. *Aciphylla ferox*

this, one of the more commonly seen, has elongated lanceolate leaves.

Aciphylla ferox. It is difficult at first sight to accept this as a member of the Umbelliferae. It has stiff grass-like leaves and huge spiny, racemose inflorescence of yellowish flowers (Fig. 11).

Dracophyllum gramineum. Another plant with very narrow leaves, this one is a member of the Epacridaceae, with long tubular orange flowers.

Raoulia sp. This genus, which belongs to the Compositae, produces dense woolly tufts known as "vegetable sheep" and occurs usually in bare open alpine passes.

The following morning, November 26, we drove to the Tasman Glacier, a gigantic ice-floe originating in the Mt. Cook complex and extending many miles down toward the Hooker River. We were told that the ice moves at a rate of three or four inches a day and that at the beginning of the century it completely filled a valley which is two miles across and the floor of which was far below us. The lower reaches of the glacier are buried under a dense mantle of debris, but higher up near the 4000 foot level the ice, which is at least 1000 feet thick, is covered with fresh, dazzling white snow (Fig. 12).

That afternoon weather conditions made it impossible for us to fly from Mt. Cook. We therefore traveled by bus to Pukaki where a chartered plane flew us to Te Anau. The first portion of the flight was across rugged, treeless country, but later we flew over range after range of mountains, the lower slopes of which were clothed by "beech" *(Nothofagus,* probably *N. Menziesii)*.

Te Anau lies on the shore of a lake of the same name. The spacious grounds of our comfortable hotel had been laid out and planted by someone with imagination and a wide knowledge of horticultural material (Fig. 13). The members of our group spent a great deal of time wandering around and admiring the effect. There were many species of *Hebe*, unfortunately not any of them labeled. There were several cultivars of New Zealand flax *(Phormium tenax)* and the deep red foliage of *Photinia glabra* and *Dodonaea viscosa* contrasted sharply with golden-leaved forms of *Chamaecyparis* and other conifers.

The southwest coast of South Island is indented by some 15 saltwater inlets which penetrate into the very heart of the snow-capped mountains producing scenery highly reminiscent of Norway. One of the most magnificent of these fiords is Milford Sound. We had flown there from Queenstown in 1972, but this time went by motorcoach from Te Anau departing on the morning of the 27th.

For many miles we drove along the shores of the lake where the dominant native plant was New Zealand "tea" *(Leptospermum)*, with its very dark green foliage. The countryside was enlivened by frequent patches of Scottish broom *(Cytisus scoparius)* which has become thoroughly naturalized here. There was also a great deal of a yellow-flowered lupine (probably *Lupinus luteus)*, likewise escaped and established.

As we entered the Eglinton Valley we found ourselves in a typical "beech" forest made up largely of red beech *(Nothofagus fusca)*. At one brief stop we found two interesting members of the Araliaceae *(Neopanax Colensoi* and *Schefflera digitata), Weinmannia racemosa* (which we had seen first at Rotorua), *Griselina lucida* (member of the Cornaceae) and *Coriaria sarmentosa,* the last-named reputed to be quite as poisonous as the related *C. japonica*.

As we proceeded on our way we began to notice a small tree with clusters of dark pinkish flowers. It was not until we stopped to enjoy a view of the waterfalls at Cascade Creek that we were able to get a close look at this plant which proved to be wineberry or *Aristotelia serrata*, a member of the Elaeocarpaceae.

Our road then led through the Hollyford Valley, affording majestic views of mountains on all sides, passed through the Homer tunnel and descended to Milford Sound. Here we boarded a launch and cruised for some two hours on the waters of the sound, surrounded by sheer walls of rock many of them bedecked by shimmering waterfalls (Fig. 14).

On the drive home we stopped at the eastern end of the tunnel to photograph the "Mt. Cook lily". While there we were amused at the antics of a flock of kea, which had landed on a parked car and were using its roof, windshield and hood as sliding boards. It reminded some of us of the

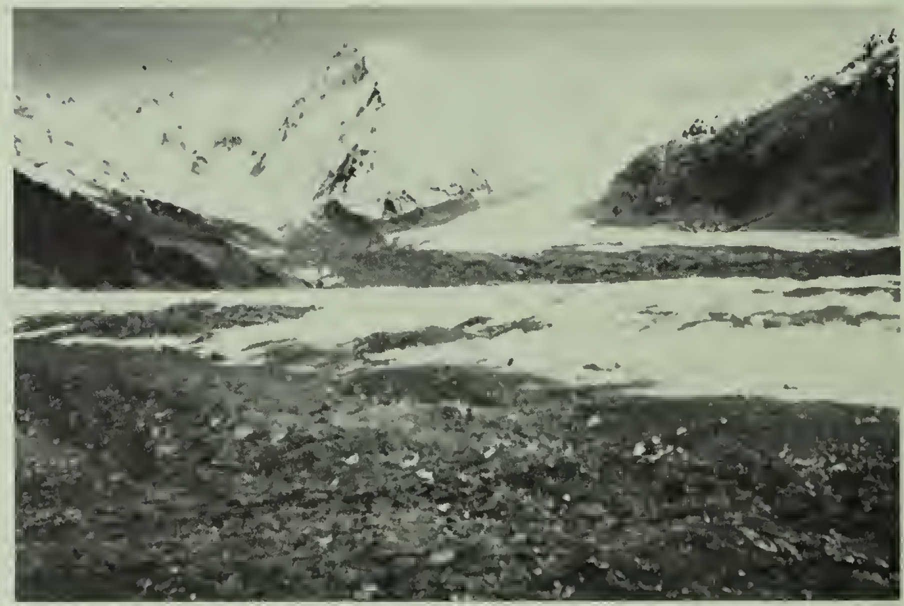


Fig. 12. The Tasman Glacier

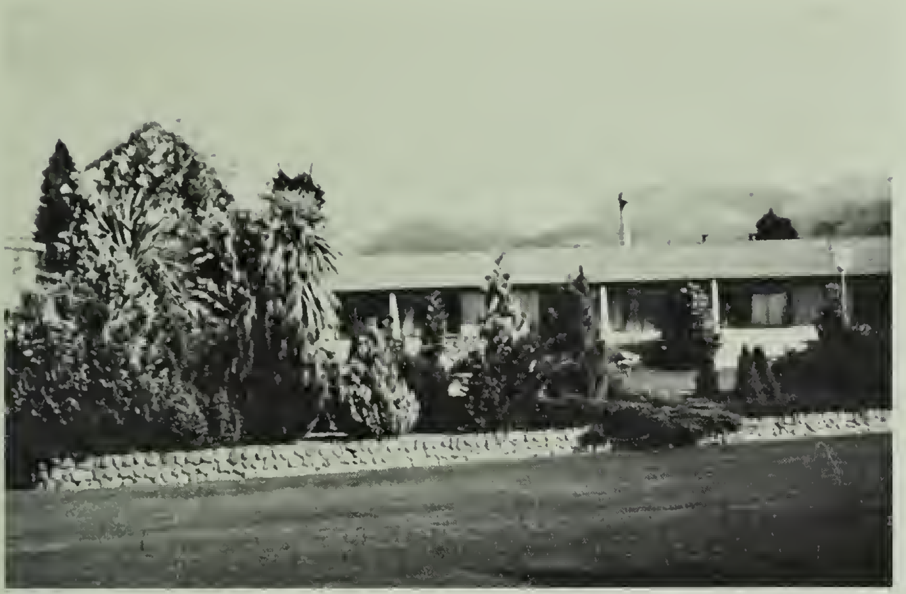


Fig. 13. Grounds of Te Anau Hotel

account of these clownish green parrots in Gerald Durrell's delightful book, *Two in a Bush*.

The following afternoon we flew from Te Anau to Christchurch. Due to the idiosyncrasies of flight scheduling our time here was curtailed to a mere half day most of which was spent in the beautiful Botanic Garden where Mr. H. Gilpin, the Director, and Mr. L. J. Metcalf, his assistant, met us and showed us around.

The earlier issue of this *Newsletter* describes some of the more interesting features of this great garden with its inexhaustible treasures. Mention should be made, however, of a few things which were not in bloom at the time of that visit. One was *Buddleia globosa*, a handsome yellow-flowered species from Peru. Another plant with yellow flowers was *Cytisus Battandieri*, which has defeated all our attempts to grow it at the arboretum. There was a fine display of *Leptospermum*, in colors ranging from red, through old rose and pink to white (Fig. 15). Around one of the ponds were three species of *Gunnera*, one with gigantic leaves up to five feet in diameter. As a dramatic contrast, Mr. Metcalf showed us a ground-cover planting of *G. prorepens*, in which the leaves were no more than three or four inches in width. The remaining moments of the morning were spent in the very fine museum, which adjoins the garden, and that afternoon we flew from Christchurch to Melbourne, the capital of Victoria, Australia.

On our visit to Melbourne's Royal Botanic Garden the following morning we were welcomed by Dr. David M. Churchill, the Director, who generously devoted two hours of his time to pointing out the outstanding trees and some of the garden's most impressive vistas. It would be difficult to conceive of a garden in which the three objectives of botany, horticulture and landscape design are more skillfully combined than in this one (Fig. 16).

That afternoon we visited the Healesville Sanctuary with its fine collection of Australia's unique animals and on the way home paused to inspect Captain Cook's cottage in Fitzroy Park.

It was a matter of great regret to us that time did not permit of visits to Adelaide, with its fine garden, or to that of Canberra whose collections are dedicated to growing only native Australian species. However, one can not do everything on a month's tour and so on Saturday, December 1, we flew from Melbourne to Cairns which is located at the base of the Cape York Peninsula, in the state of Queensland.

Our reason for going to Cairns was that it provides access to the Great Barrier Reef, that prodigious coral formation which extends for more than 1250 miles along the eastern coast of Australia.

The mayor of Cairns, who had somehow learned of our presence, very kindly assigned his Superintendent of Public Parks, Mr. Vincent Winkel, to accompany us during our stay. This was indeed fortunate, since Mr. Winkel possesses a broad knowledge of horticultural plants as well as a familiarity with the native flora. On Sunday, December 2, he and his family went with us on the launch to Green Island. This is what is known as a coral cay and there are hundreds like it, both large and small, on the Barrier Reef. It boasts an underwater observatory, an aquarium or marineland, and a good restaurant, all of which we visited. Our first activity, however, was a cruise in a glass-bottom boat to observe the indescribably varied submarine life of a coral reef—corals of many types, sea anemones, starfish, sea slugs, giant clams and such countless schools of multicolored fish as to send our camera fans into frantic ecstasies.

Following lunch Mr. Winkel took us on a walking tour of the island, which can easily be encompassed in a half hour. The entire cay is heavily wooded (hence its name) but on the leeward side there are broad beaches occupied, as one might expect, by such ubiquitous tropical littoral plants as *Ipomoea pes-caprae*, *Canavallia maritima*, a *Scaevola* (in this case *S. taccada*) and that interesting shrubby member of the Boraginaceae, *Messerschmidtia maritima*. Scrambling over much of the vegetation was a stringy orange-colored parasite looking like our dodder or *Cuscuta*, but actually a species of *Cassytha* belonging, of all things, to the Lauraceae.

On the windward side, where the reef organisms are exposed at low tide, the effects of wind and wave action are everywhere evident. Here one of the conspicuous plants was the screw-pine or *Pandanus* with its stilt-like

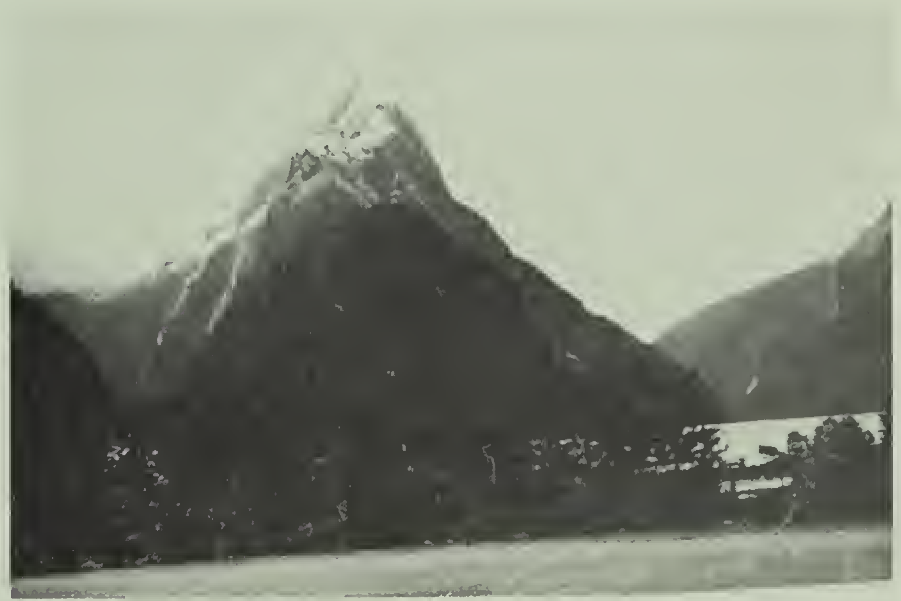


Fig. 14. Mitre Peak on Milford Sound

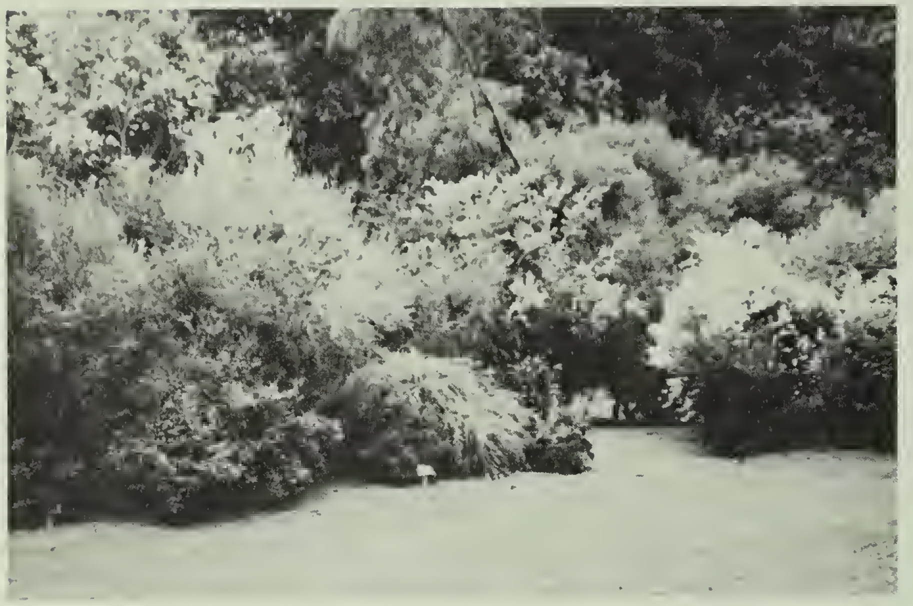


Fig. 15. *Leptospermum* in Christchurch Botanical Garden

adventitious roots. Everywhere on tropical shores one observes the sea almond, *Terminalia Catappa*. Here instead was *T. melanocarpa* a tree with blue plum-like fruit. In addition to the coconut palm there was *Arenga australasiatica*, a relative of the sugar palm.

The following day we went by train up to Kuranda. Mr. Winkel apologized for the antiquity of the rolling stock, saying that they really did have more modern coaches, but we thought it great fun to be able to stand out on the open vestibule, enjoying a much closer look at the vegetation.

The ride was truly spectacular, passing first through fields of sugar-cane, then ascending through the gorge of the Barron River and providing views of Barron Falls and Stony Creek Falls.

Our bus met us at the station at Kuranda and we started out on our drive across the Atherton Tablelands, a region dominated largely by eucalypts or gum-trees in the uplands and dense tropical rain forest in the valleys. In one area we were interested to see a large number of termite nests and at another we stopped to admire specimens of that remarkable plant known as grass-tree or *Xanthorrhea*, a member of the Agavaeae. This one, Mr. Winkel told us was *X. Johnsonii* (Fig. 17).

Luncheon was at a restaurant overlooking the Tinaroo Dam which impounds a large body of water surrounded by tropical woodland. In the afternoon we visited two large lakes situated in the craters of extinct volcanoes.

The first of these was Lake Eacharn and from its steep shores, formerly the rim of the crater, we looked down through a dense tangle of tropical vegetation into an almost circular mirror of limpid blue water.

The second was Lake Barrine, a larger and more irregular body of water almost completely surrounded by tropical rain forest which, Mr. Winkel assured us, was one of the richest in species of any such plant community in the world—not excluding the Amazon! It is always difficult to photograph a rain forest when one is surrounded by it, but perhaps the accompanying photograph taken across this lake will convey some impression of its character (Fig. 18).

We walked up a short trail from the shores of the lake to view a pair of gigantic trees known as the "Twin Kauris". These were not *Agathis robusta*, the kauri of southern Queensland, but *A. Palmerstonii*, a species we had not seen before. The larger of the two had a circumference of more than 20 feet and was over 145 feet high.

That evening as we stood in the garden of our hotel trying to make out the constellation of the Southern Cross, flights of fruit-bats passed overhead on their way to the forests where we had been a few hours earlier.

Since we were leaving Cairns at noon on Tuesday Mr. Winkel called for us early and conducted us to the splendid botanical garden which, within the short span of seven years, has been created under his direction. This garden consists of more than 800 acres, most of it occupied by a trail that leads far up a steep hillside into luxuriant rain forest. This we did not have time to explore, but the part we did see was very impressive. It contained many thousands of orchids, marvelous palm, many kinds of ferns, lycopods and cycads as well as almost every important group of tropical fruits and ornamentals.

That afternoon we flew from Cairns to Sydney and for many miles had the countless islands of the outer Barrier Reef in view on our east.

The morning of Wednesday, December 5, was devoted to visiting the Royal Botanic Gardens in Sydney—Australia's oldest garden. Although Dr. L. A. S. Johnson, the Director, was overseas at the time, he had kindly designated a member of his staff, Mr. A. N. Rodd, to be our guide and mentor. We had met Tony Rodd on our earlier visit and were delighted once again to be able to profit by his intimate knowledge not only of horticultural material but also of a native plants (Fig. 19).

Although my wife and I had been here nearly two years before it all seemed new and unfamiliar. This was partly because of the vast size of the garden, but also because of the difference in the season. For example, one of the plants we had completely missed before was *Castanospermum australe*, a monotypic native leguminous tree now resplendent with bright scarlet flowers.

Another tree which was putting on a good show was *Lagunaria Patersonia*, a member of the Malvaceae with

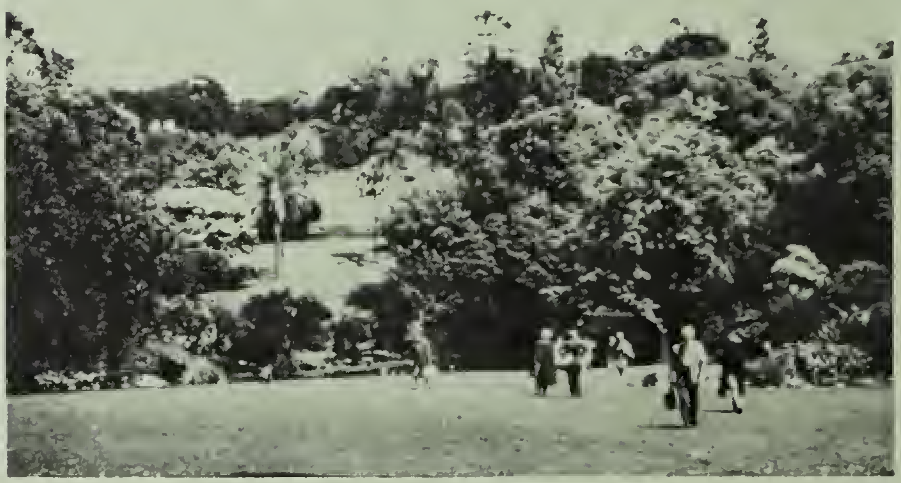


Fig. 16. View in Royal Botanic Garden, Melbourne

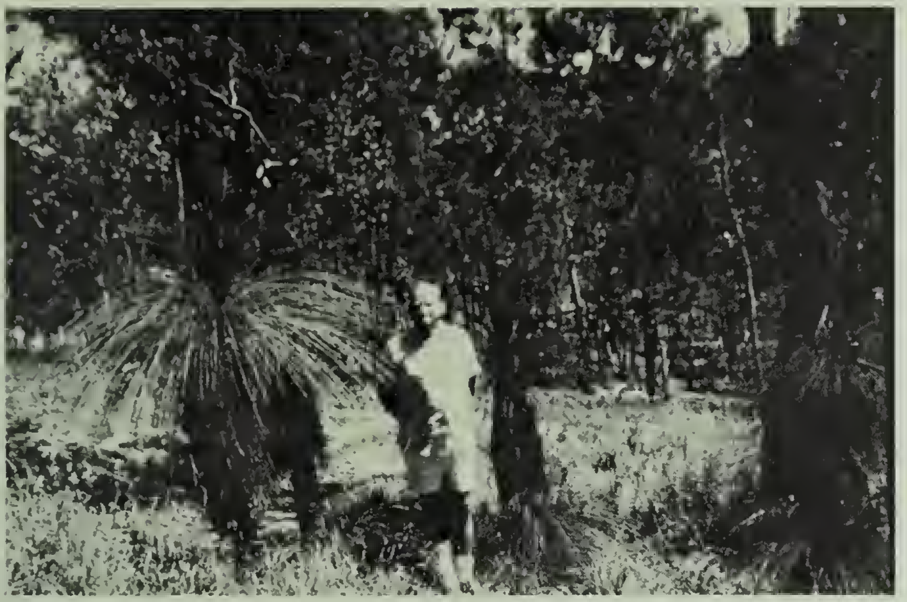


Fig. 17. *Xanthorrhea Johnsonii* and Mr. Vincent Winkel

pinkish flowers. This species is said to have been introduced into Australia from Norfolk Island by Alan Cunningham. Both Alan and his brother Richard were intimately associated with the beginnings of this garden in the 1830's. Alan died in 1839 and his remains are interred in an obelisk which stands today in a small pond in the garden.

That afternoon, as was inevitable, we drove some 20 miles south of Sydney to Botany Bay, the place where in late April 1770, the *Endeavour* had put in and where Joseph (later Sir Joseph) Banks and his companions had gone ashore and discovered such a rich vegetation that the bay now bears its very appropiate name (Fig. 20).

Here we visited the Cook Museum and saw one of the six cannons from the *Endeavour* recovered a few years ago by a team of scientists from the Philadelphia Academy of Natural Sciences.

On the following day, December 6, our itinerary called for a drive to Sublime Point, at Bulli Pass, then by way of Wollongong and the Macquarie Pass to a sheep station for a ''bush barbecue'' luncheon with local wines.

A few miles south of Sydney we came to the town of Gymea, which our driver informed us was called after a giant lily of that name. The plant had a large rosette of basal leaves and a tall scape terminating in a corymb of bright orange-red flowers. It is not truly a lily but rather a member of the genus *Doryanthes*, belonging to the Amaryllis family, and we recalled having seen it, although not then in flower, back in Albert Park in Auckland.

Farther on we came to Bulli, the turn-off for Sublime Point. Some of us left the coach at that stop to collect and photograph plants. For many miles we had been seeing a shrub which bore a strong resemblance to the ''tea'' plant of New Zealand and such indeed on closer inspection, it proved to be, only in this case *Leptospermum flavescens*, a species we had not hitherto seen. With it were *Hakea salicifolia* and *Petrophila frutescens*, both members of the ubiquitous Proteaceae, and *Patersonia*, a handsome blue-flowered relative of the iris with delicately fringed petals.

We then walked a short half mile back to rejoin the rest of our group and to enjoy the superb view from Sublime Point looking southward along the coast of New South Wales.

Modoroma, the site of our barbecue luncheon, is situated in a serene tableland with enchanting views in all directions of undulating terrain, colonies of eucalypts, streams and flocks of sheep. Following our meal we were treated to an exhibit of sheep being rounded into a corral by a pair of enormously clever sheep dogs, the shearing of a very woolly ewe and a lesson in boomerang throwing, in which members of the tour participated with varying degrees of success.

That evening, in Sydney's fabulous new multi-million dollar opera house, we attended the debut of the Australian Ballet Company in its magnificent performance of Tchaikovsky's *Sleeping Beauty*.

On Saturday, December 8, we left Sydney on a flight to Nadi on the island of Viti Levu in the Fiji Islands. After spending that night at the Mocambo Hotel we drove the following day some 40 miles along the south shore to the beautiful Fijian Resort on Yanuca Island.

No one had told us that we were coming to Fiji at a time when hurricanes were still in season. That night we were treated to an exhibition of one of nature's more violent moods: torrential downpour and winds so fierce that it seemed as though nothing could withstand them. ''This is not a hurricane,'' we were told, ''only a tropical storm.'' Nonetheless, on one of the 250 islands in this archipelago, discovered by Abel Tasman in 1643, 5000 persons were rendered homeless and two steamers capsized with considerable loss of life. Obviously (and fortunately) we were just on the ''fringe.''

This verdict was confirmed the following morning when a tour of the grounds revealed that the damage was minimal and that there was a great deal of interest to be seen.

The broad expanse between the hotel and the beach was occupied almost entirely by coconuts, with an occasional screw-pine or *Pandanus*, in this case *P. odoratissimus*.

Behind the hotel, however, there was a diverse conglomeration of species, some native, others introduced. A conspicuous tree was the candle-nut *(Aleurites moluccana)*, a member of the Euphorbiaceae with grey-green, triangular leaves and clusters of whitish flowers. Another was *Calophyllum inophyllum* of the Guttiferae,

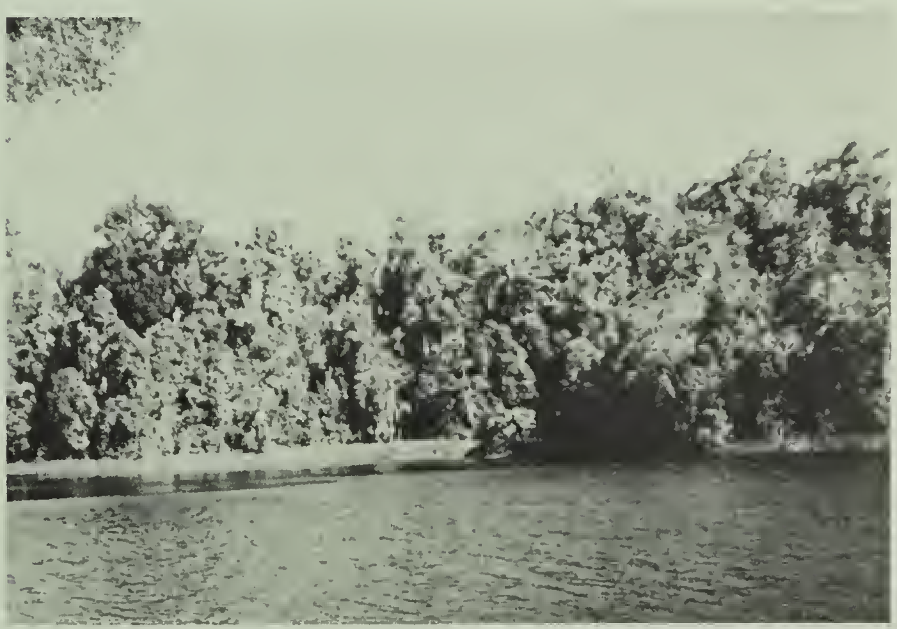


Fig. 18. Rain forest across Lake Barrine

Fig. 19. View from Royal Botanic Garden, Sydney

with shiny, dark green leaves and many-stamened, fragrant white flowers. The hard, round fruits of this species may be found scattered on tropical beaches throughout the South Pacific. *Hibiscus tiliaceus*, of course, was here, as in so many island groups, its large yellow flower turning salmon-pink and falling to the ground as the day wears on.

Among introduced plants we saw the white shrimp plant, *Justicia betonica*, a shrub belonging to the Acanthaceae and closely related to our more familiar shrimp plant, *Beloperone*, of the same family. A rampant groundcover melastome, with large pink flowers was *Dissodia rotundifolia*. Another prostrate plant was a member of the Gesneriaceae which we took to be a species of *Hemigraphis* (probably *colorata*). There was also a creeping cucurbit with pure-white star-shaped flowers which we were unable to identify with any of the books we had with us.

At low tide the members of the party enjoyed walking out on the inner reef, collecting corals, shells, starfish, etc.

On Tuesday, December 11, we were scheduled to drive from Yanuca to Korolevu, some 30 miles to the east of us, and thence to travel by launch to the island of Vatulele, some 18 miles south of Viti Levu. We set off in a fleet of small cars only to be informed when we reached Korolevu that, because of rough seas, our trip had been canceled. They had tried in vain to reach us by phone (the lines were down). Then, by what circuitous means we knew not, they had cabled us to inform us of the cancellation. However, that cable did not reached us until it was delivered to our room following our return. The captain of our launch was therefore somewhat nonplussed at our arrival, but agreed that the seas had subsided to the level that we might embark upon our voyage with safety.

While waiting for ship to be made ready we wandered along the beach which was piled high with driftwood from the storm. We picked up shells, pieces of coral and the large, flat, rounded, polished, mahogany-colored seeds of *Entada*, often two or three inches in diameter. These come from a leguminous vine with pods which may be three feet or more in length. We also found on the ground the large pink, powder-puff flowers of *Barringtonia*, which are shed early in the day.

Our voyage to Vatulele, some 18 miles away, was somewhat rough though not dangerously so. Since there was no wharf we had to be taken ashore a few at a time in a small dinghy.

The specialty of this island is the making of tapa cloth and the first sound we heard upon landing was the pounding of the fibers in a large thatched hut. Whether this goes on all day every day, or was staged to time with our arrival we never learned. At any rate, we saw long strips of undyed tapa laid out on the grass to dry and then visited the "village store." This consisted of a double row made up of all the female and juvenile members of the community seated on the ground behind their wares. Here the tapa cloth had been cut into mats of varying sizes and ornamented with intricate patterns in brown and black made from vegetable dyes. Also on display were shells and strings of beads.

We asked to see the tree from which the tapa cloth is made and were led across a taro patch and shown a couple of small saplings from which all but the upper leaves had been stripped. Although we were told that this island was the only place where this tree occurred, it looked to us suspiciously like *Broussonetia papyrifera*, a native of southeastern Asia.

While waiting to be ferried to and from our launch we had noticed an interesting tree with large cordate leaves. This was *Hernandia peltata* and while we had first seen it near our hotel at Yanuca, here on the island it was in full fruit which is a small dark structure surrounded by a translucent spherical envelope (Fig. 21).

On our drive from Korolevu back to Yanuca we had fleeting glimpses of the sun as it descended behind range after range of forested hills.

Our return from the South Pacific was broken by two days in Hololulu, where we arrived on December 12. The following morning we went first to visit the Foster Botanical Garden, where we were cordially welcomed by Dr. Paul R. Weissich, the Director, and Mrs. J. S. Babcock, Chairman of the Volunteer Guides.

Fig. 20. Sandstone headlands at Botany Bay

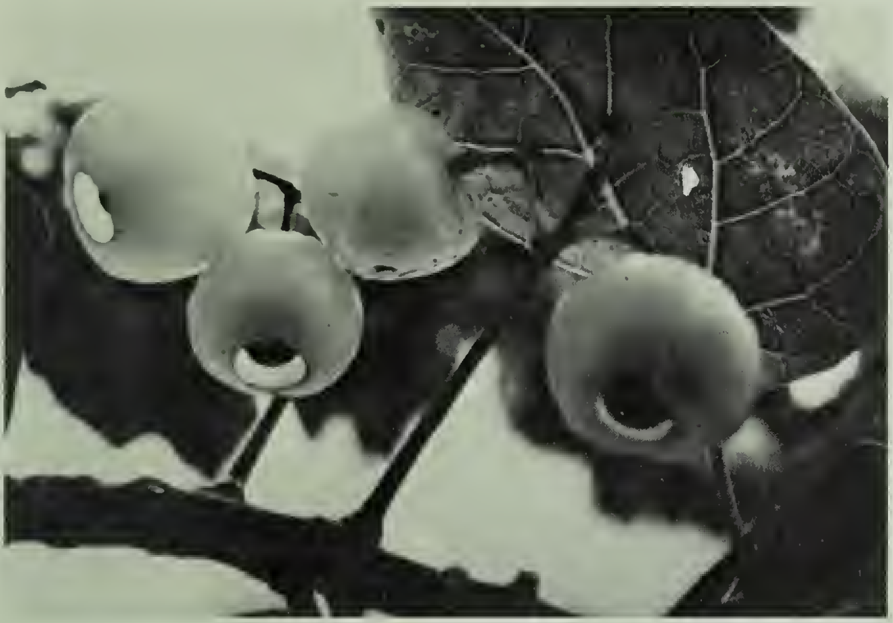


Fig. 21. Fruit of *Hernandia peltata*

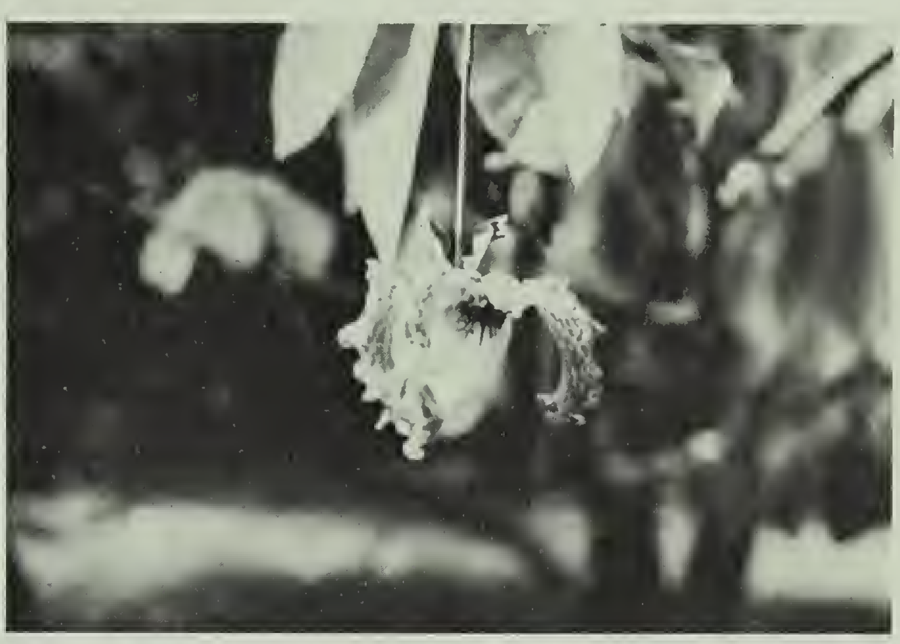


Fig. 22. Flower of *Monodora myristica*

Some of us had visited this distinguished garden in 1969, when our tour was on its way to Japan and Taiwan and on that occasion Mrs. Babcock had shown us around. However, that was in May and now it was December. Hence there were several plants in flower which we had not seen before.

An earlier issue of this *Newsletter* (Number 3, September 1969) contains descriptions of some of the fine old trees growing here, many of them dating back to the days of Dr. William Hillebrand, who established this garden in 1855.

One of the most exciting plants which we saw was *Monodora myristica* of the Annonaceae, known as nutmeg tree or orchid-flower tree. The "upside-down" flowers of this species hang from long peduncles. The three outer petals are of a bright orange-yellow with dark reddish-purple markings, contrasting sharply with the smaller, paler inner ones (Fig. 22).

Another interesting tree which was in full bloom was *Kleinhovia hospida*, or "guest tree", of the Sterculiaceae. The bright pink flowers of this species owe their effect to the sepals of the calyx, since the petals are relatively inconspicuous.

Also in flower at the time of our visit were *Calliandra inaequilatera* (of the Leguminosae), several species of *Mussaenda* and the bizarre cannon-ball tree, *Couroupita guianensis*. I reminded the members of our group that in India this is known as "cobra flower". They could easily understand why.

Our second and last visit of the day was to the Harold Lloyd Lyon Arboretum, where the Director, Dr. Yonea Sagawa, and two members of his staff were waiting for us.

This arboretum of 124 acres lies in the beautiful Manoa Valley. It was established in 1918 for the dual purposes of studying the tropical rain forest vegetation and collecting and growing plants of potential economic value. Since its affiliation with the University of Hawaii in 1953 it has become an important center for research and instruction in many fields of biology.

We were first conducted to the reception center where we were offered refreshing drinks and from where we had a superb view of the surrounding mountains with their dense cover of tropical vegetation.

A short walk through the arboretum grounds and up a steep wooded trail yielded many interesting novelties. One of these was a shrub named *Wagatea*, a handsome legume from India with long racemes of brilliant red and yellow flowers. The genus *Macaranga*, of the Euphorbiaceae, was represented by several specimens, all with large peltate leaves. We were interested in a shrubby white-flowered labiate with long exserted stamens which confer upon it the highly appropriate common name of "cat's whiskers". This was *Orthosiphon aristatus*. The lipstick plant, *Bixa orellana*, was represented by several fine plants in full fruit with their reddish brown spiny capsules. An arresting sight was a huge *Medinilla*, which we were told was an undescribed species from North Bornea. At one place we were shown a plantation of taro containing some 300 cultivars which are being carefully studied.

As we departed Dr. Sagawa presented us with copies of several of the arboretum's publications which cover a wide variety of subjects. One of the most interesting was a 28-page account by A. C. Smith entitled, *The Pacific as a Key to Flowering Plant History*. Altogether, this relatively young arboretum has made an enviable record and is well worth a visit. Only please allow at least two hours!

On Friday, December 14, we flew from Honolulu to San Francisco where we spent the night before leaving for home the following day.

Figs. 9, 10 and 22 by Albert M. Suggs

NOTES FROM THE ARBORETUM

THE STAFF

On October 12 Dr. Gordon delivered an illustrated lecture on "Homes of Wild Flowers" at the Hickman Home for retired persons in West Chester and on November 10 he and Mrs. Gordon were the guests of honor at the formal dedication of a Natural Area for Environmental Studies on the South Campus of West Chester State College, the use of which will be supervised by the Department of Biology.

During the fall of 1973 Mrs. Hopkins supervised the construction of the Mabel Pew Myrin Memorial Garden for the Lankenau Hospital in Overbrook, Pennsylvania. She donated the design and her time in memory of her father, Earl L. Bazemore, who at one time had been a student in the Arboretum School. This garden was dedicated with appropriate cermonies on Monday, October 29.

In September 1973, Dr. Penny, as botanical consultant for Southern Services, Inc., carried out vegetational surveys on three Gulf Coast rivers in western Florida: the upper Appalachicola, the Yellow, and the Choctawhatchee River Systems. The surveys were made in connection with environmental-impact studies near proposed sites for electrical power plants.

On September 20 Dr. Fogg spoke to the Mill Creek Valley Garden Club on the subject of "A Visit to the Pacific Northwest" and on November 8 he gave a lecture entitled "Heaths, Heathers and their Relatives" to the Old York Road Garden Club. At a meeting of the Philadelphia Botanical Club on December 20 his topic was, "A Botanist Down Under - Impressions of New Zealand and Australia."

THE HARVEST SHOW

The 1973 Harvest Show of the Pennsylvania Horticultural Society was held in Memorial Hall in Fairmount Park on Saturday and Sunday, September 29 and 30.

For this occasion several students of the Arboretum School prepared an exhibit entitled "Trees and Shrubs to attract Birds in Fall and Winter."

This project was initiated by Mrs. Graham Humes and ably carried out by Mrs. David Maxie and Mrs. Stephen Cleaves, assisted by Mrs. Ulf Hammarskjold.

The exhibit consisted of 114 specimens of plants carefully labeled and attractively arranged against a background of colorful pictures of birds with explanatory captions.

As might be expected, most of the plants bore fleshy fruits and such genera as *Cornus, Cotoneaster, Crataegus, Ilex, Lonicera, Malus* and *Viburnum* were well represented.

Attention was also given to the matter of cover, which is second only to food in inducing birds to prolong their autumn visits or even to linger on into winter. In this connection specimens of various conifers, such as pine, spruce and hemlock as well as certain broad-leaved evergreens were included.

The artistic and educational features of this exhibit attracted a great deal of attention and resulted in its being given the Award of Merit of the Pennsylvania Horticultural Society.

A FURTHER NOTE ON THE CHINESE TULIP-TREE

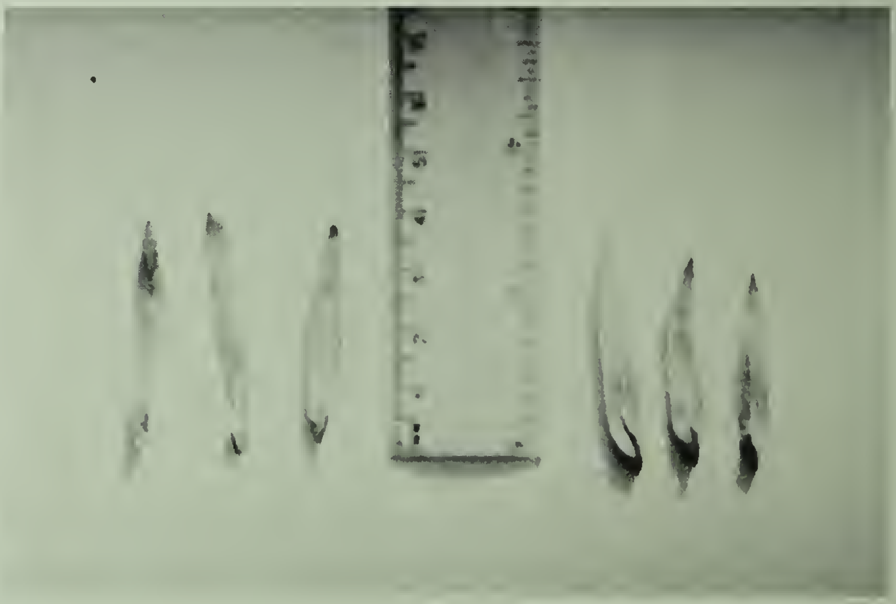
The issue of this *Newsletter* for September, 1973 (Number 11) contained a brief account of the first observed flowering of the Chinese tulip-tree, *Liriodendron chinense* (Hemsl.) Sarg. on the grounds of the Arboretum.

Toward the end of October the tree fruited sparingly and material was collected, photographed and studied.

Since this species has not too frequently been observed in the fruiting condition it seems desirable to place on record the following information.

In Rehder's *Manual of Cultivated Trees and Shrubs*, Ed. 2, 1940, the key separating *L. chinense* from the American *L. Tulipifera* states that in the former the mature carpels are obtuse or obtusish at the apex in contrast to those of the American species in which they are acute. This is a somewhat subtle distinction, as shown in the accompanying photograph, which may be strengthened by noting that at least in our material the carpels of *L. chinense* average 3.5 to 4 cm. in lenght, whereas those of *L. Tulipifera* are shorter, measuring only 3 to 3.5 cm.

The difference in the length of the carpels correlates well with that of the entire cone-like structure, which in *L. chinense* is 8 to 8.5 cm. long while in *L. Tulipifera* is seldom exceeds 7 cm.



Mature carpels of *L. chinense* (left) and *L. Tulipifera*